Study on the Effectiveness of Modeling and Simulation in the Weapon System Acquisition Process

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Final Report

Forward

In August 1995, I commissioned a one year study with the objective of assessing the effectiveness of the use of modeling and simulation (M&S) in the acquisition process. In particular, I was looking for the metrics by which the Department of Defense could ascertain the value—if any—that was returned on its investment in M&S in terms of the reduction in time, resources, and risk in weapons systems development and fielding and in terms of increase in the military utility of those systems. I also tasked the study team while gathering information to support the assessment to note technical and other challenges to realizing the postulated benefits and to report on specific M&S tools and processes being used to facilitate the acquisition of systems in the DoD and industry.

This report, which documents the results of that study, provides tangible, quantitative indicators that the use of M&S can provide substantial benefit measured in time, cost, productivity, and system quality and performance. The evidence is consistent and pervasive, across both DoD and industry. I personally was impressed that the most significant return on investment was realized when M&S was used as an integrator of functions within the acquisition process, i.e., integrating design and manufacturing or linking requirements more closely to test. This leads me to believe that its real value lies as an enabler of Integrated Product and Process Development (IPPD).

The research also sheds light on the work that remains to be accomplished if the Department is to truly realize the full potential of M&S in providing enhanced capability to its warfighters. Technical, managerial, and cultural challenges remain to be addressed. The study team has made some recommendations. The acquisition community may draw additional conclusions from the study on actions that should be taken.

I am therefore providing this report on the "Effectiveness of Modeling and Simulation in the Weapon System Acquisition Process" to the defense acquisition community for the multiple purposes of alerting acquisition professionals to the potential of M&S technologies; of establishing a broader basis for supporting investment and employment decisions on M&S in the Department; and of embarking on a strategy to more fully achieve the vision of Simulation Based Acquisition.

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